

transistor between a supply voltage and an output terminal (Abstract). Referring to Fig. 1, when the voltage on output terminal 28 falls below the regulated value (i.e., 5 volts), the corresponding voltage on the noninverting input of comparator 20 (as determined by the value of resistors RA and RB) falls below the band gap reference voltage (i.e., 1.25 volts) supplied to the inverting terminal of comparator 20. This drives transistor 13 which brings the voltage at output terminal 28 back up to the regulated value, i.e., it is pulled up to the battery supply voltage  $V_{BAT}$  through transistor 13 (column 4, lines 15-26). Notably, unless  $V_{BAT}$  is also dropping, transistor 45 is not conducting during the operation of this voltage regulating circuit (column 4, lines 58-59).

That is, transistor 45 is part of a separate circuit which reacts when the supply voltage  $V_{BAT}$  goes low to keep  $V_{OUT}$  up as long as possible (column 4, lines 26-62). When  $V_{BAT}$  goes below a certain level (thus undermining the operation of the separate voltage regulating circuit which includes transistor 13), the voltage at the noninverting input of comparator 42 goes below the reference voltage supplied to the inverting input of comparator 42, thus turning on transistor 45 (connected in parallel with transistor 13) thereby connecting  $V_{BAT}$  to the output terminal 28 and keeping  $V_{OUT}$  higher longer. That is, there are two separate circuits, one using transistor 13 to regulate the output voltage during normal operation, and a second independent circuit for holding up  $V_{OUT}$  when  $V_{BAT}$  fails (see also column 5, lines 1-37). Thus, transistor 13 has nothing to do with the operation of transistor 45. Indeed, transistor 45 is preferably much larger than transistor 13 so that it is virtually a short circuit across transistor 13 when the circuit employing transistor 13 can no longer effectively regulate  $V_{OUT}$  (column 4, lines 31-33 and lines 58-59).

By contrast, claim 1 recites that “the switch control circuitry comprises *a voltage regulator configured as a voltage controlled current source* for providing a *control signal* to the switch circuitry.” An example of this recited feature is shown in Fig. 1 of the present application and described in the present specification beginning at page 6, line 10. As described resistors R2 and R3, transistor Q2, and voltage regulator U1 are configured as a voltage controlled current

source such that in overvoltage and undervoltage conditions, the fixed voltage output of regulator U1 provides less or more current, respectively, to transistor Q2. This, in turn, results in regulation of current between VIN and VCC via transistor Q1 accordingly (i.e., due to the current drawn by regulator U1 causing a voltage drop across resistor R1).

Because Nguyen uses a simple voltage divider and comparator combination, it cannot be said to anticipate or even obviate the circuit recited in amended claim 1.

The Examiner has mischaracterized the circuit components of Nguyen stating that “transistor (13) ... [is] configured as a voltage controlled current source to provide a control signal to control the switching circuit (45).” As described in Nguyen and as reiterated above, the operation of transistors 13 and 45 are independent of each other. Neither provides a control signal to the other. Rather, transistor 13 is controlled during normal operation by the resistor divider comprising  $R_A$  and  $R_B$  (sensing  $V_{OUT}$ ) and comparator 20. It is only when  $V_{BAT}$  fails (and transistor 13 can no longer do the job) that transistor 45 comes into play, effectively providing a short circuit across transistor 13. Moreover, the control of transistor 45 is effected not by transistor 13, but by a second resistor divider comprising resistors 38 and 39 (sensing  $V_{BAT}$ ) and comparator 42.

The Examiner has failed to identify a *voltage regulator configured as a current source* which *provides a control signal* to control switch circuitry. Therefore, the cited reference cannot be said to anticipate the claimed invention. In view of the foregoing discussion the rejection is believed overcome. The rejections of claims 2-7, and 10-12 are believed overcome for at least the reasons discussed.

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**CONCLUSION**

In view of the foregoing, Applicants believe all claims now pending in this application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested. If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at (510) 843-6200.

Respectfully submitted,  
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